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SITUATIONAL FAVORABILITY AND THE PERCEPTION OF UNCERTAINTY: AN EXPERIMENTAL DEMONSTRATION

Delbert M. Nebeker, et al

Washington University

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SITUATIONAL FAVORABILITY AND THE PERCEPTION OF UNCERTAINTY: AN EXPERIMENTAL DEMONSTRATION[1,2]

Delbert M. Nebeker

Navy Personnel Research and
Development Center
San Diego, California

Lee R. Beach and Stephen G. Green

University of Washington
Seattle, Washington

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This study examines the relationship between situational favorability and the perception of uncertainty and risk in an experimental setting. Seventy-one subjects were presented frou paper and pencil simulations of leadership situations based on Fiedler's model. Estimates of perceived uncertainty and risk were derived from a number of scales presented to the subjects following each situation. Results indicated that uncertainty and risk was significantly related to situational favorability with favorable

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situations having certainty and little risk while unfavorable situations were uncertain and risky. These results support an interpretation of situational favorability as a dimension of perceived uncertainty, validating previous research and integrating Fiedler's work with other contingency theories as well as decision research.

SITUATIONAL FAVORABILITY AND THE PERCEPTION OF UNCERTAINTY: AN EXPERIMENTAL DEMONSTRATION[1,2]

Delbert M. Nebeker
Navy Personnel Research and Development Center
Lee R. Beach and Stephen G. Green
University of Washington

Contingency approaches to leadership and organization theory agree in assuming that there is no single best way to lead or organize (Fiedler, 1967; Lawrence & Lorsch, 1969; Thompson, 1967; Woodward, 1968). One of the most influential of these is Fiedler's theory of leadership effectiveness (Fiedler, 1967, 1971, 1972). However, the theory has not been without critics (Ashour, 1973, Graen, Orris & Alvares, 1971; Korman, 1972); part of their concern stems from the frequent changes Fiedler has made in the number and kind of variables he uses to define what he calls situational favorability. As Korman (1972) points out, for any contingency theory to predict consistently it is necessary for it to clearly define the dimensions it uses to categorize situations. When this is done, the dimensions can be compared to those of other contingency theories. At the same time, identifying the dimensions permits their measurement by a variety of techniques without altering their interpretations. Fiedler (1973) regards situational favorability as one such situational dimension, and defines it as a measure of the "control or influence" the leader has over his subordinates. Although this definition has intuitive appeal, empirical support for such a definition has not been obtained (Nebeker, 1974, in press).

Based upon recent findings by Nebeker (1974 in press) an alternative to Fiedler's control and influence definition of situational favorability is available. This alternative defines situational favorability in terms of

perceived uncertainty. Specifically, highly favorable situations are characterized as having a high degree of perceived certainty while unfavorable situations are characterized by perceived uncertainty. Such a definition has a number of advantages. First, the use of uncertainty has theoretical appeal because it has been used in other contingency theories--most notably Lawrence and Lorsch's (1969) and Thompson's (1967) organization theories. Interpreting situational favorability as perceived uncertainty suggests a possible basis for integration of Fiedler's theory with these organization theories. Second, introduction of perceived uncertainty provides a potentially valuable conceptual link between leadership theory and decision theory (Vroom & Yetton, 1973). Third, were it to prove adequate, perceived uncertainty would provide a parsimonious description of a primary psychological attribute of situational favorability; one which is easily measured.

Although strong evidence was obtained favoring a perceived uncertainty definition of situational favorability, Nebeker's (1974 in press) study was a field study yielding correlational results; the reliability and validity of these findings remain to be demonstrated in an experimental setting. Moreover, if perceived uncertainty is to be a useful theoretical concept, it must be shown to be independent of Fiedler's other major theoretical determinant of leader performance, the leader's motivation (the latter customarily is measured indirectly using a questionnaire that ascertains the leader's degree of esteem for his least preferred co-worker--LPC).

The experimental research reported here tested whether perceived uncertainty can be systematically changed by manipulations of the variables that Fiedler uses to define situational favorability. Specifically:

(1) Whether perceived uncertainty is negatively related to situational favorability.

(2) Whether more complex variables also would be systematically related to situational favorability, i.e., risk--defined here as the product of perceived uncertainty of failure and the negative utility of failure to achieve the group's goal; optimism--the product of perceived uncertainty of success and the utility of success; subjective expected utility--the sum of risk and optimism; disutility of failure; and the utility of success.

(3) Whether LPC is independent of perceived uncertainty.

(4) Whether the perceived uncertainty of a situation is independent of whether or not the subject is himself the leader in that situation. This is to obtain some indication of the sensitivity of perceived uncertainty to theoretically irrelevant but highly salient situational circumstances.

Method

Research Strategy. The strategy was to present subjects with a sample of simulated leadership situations representative of those studied by Fiedler. The subjects responded to the situations by reporting their utility for both success and failure in each of the situations and their subjective probability that if in the described situation they would be able to meet some specified new production requirements. This strategy was employed in order to provide control not available in most field settings while at the same time having subjects respond to a variety of situations. Employment of such a strategy also meant that individual comparisons could be made capitalizing on the added control of a repeated measures design.

Subjects. Seventy-one male undergraduate students at the University of Washington participated as subjects in the study. The subjects were recruited from psychology classes and were paid for their participation.

Leadership Situations. Four simulated leadership situations were constructed

using the following criteria:

(1) The situations should be representative of the classification of situational favorability (Octants I - VIII) used in Fiedler's research. Therefore they need to reflect a dichotomous classification of the important components of situational favorability most often identified by Fiedler (1967). These are: (a) How well the leader and his subordinates get along (leader-member relations); (b) How well-defined and clear the task is and its method of accomplishment (task structure); (c) How much power is available to the leader over his subordinates (position power). It also was decided to select those situations which represent the octants which typically yield the strongest predictions for performance and at the same time are the most different from each other.

(2) The simulations should be simple and inexpensive with the principle manipulations embedded in a larger situational context.

(3) The simulated situations should be such that were he in that situation, no subject would anticipate either certain success or certain failure, i.e., there would be some uncertainty or risk involved.

On the basis of these requirements, four octants were chosen for simulation, they were: (a) Good leader-member relations; high task structure and high position power (OCTANT I); (b) Good leader-member relations, low task structure and low position power (OCTANT IV); (c) Poor leader-member relations; high task structure and high position power (OCTANT V); (d) Poor leader-member relations; low task structure and low position power (OCTANT VIII).

The four narrative descriptions of leadership situations were written by varying only the above characteristics. The descriptions for Octant I and Octant VIII are presented below. Octants IV and V were merely the appropriate recombinations of the elements of the Octants I and VIII descriptions.

Octant I

"XYZ, Inc. is a small independent manufacturing firm that produces various electronic devices. The major part of XYZ's business consists of contracts from other, larger manufacturers who use XYZ components in their products.

You are the supervisor of a small assembly line operation where transistors are inserted into an electronic component as it passes on the line. The transistors are color coded to match each position in the component, thereby making the task very clear cut and minimizing confusion about how the work should be done. You have been in this position for the last five years and share a warm cooperative relationship with your subordinates; in fact, you often interact socially with them. The assembly line has performed adequately under your supervision. The workers respect you and are very supportive of your position as supervisor.

The area in which you work is a non-union shop and is, therefore, flexible in its pay scale, and in hiring and firing matters. Upper management is very supportive of your position and has granted you virtual independence in your hiring and disciplinary policies; any action which seems reasonable and effective is available to you.

Recently, in response to economic pressures, management has sharply increased the production standards for your assembly line. They have decided to allot three months for successful compliance with these new standards and at that time they will evaluate your performance."

Octant VIII

"ABC Company is a small advertising agency which is a branch of a larger parent agency. The major part of ABC's business derives from advertising contracts with local firms.

You are the General Manager of this small branch agency, having been in the position for only a few months. The job is a challenge in the creation of an advertising package for a client may be pursued in any number of ways; each contract presents a new situation which requires the creative contribution of each member of the agency. Your subordinates are still cold and distant and have yet to accept you. In fact, many of the older, more experienced workers resent you and doubt your competency as General Manager; you have had difficulty in gaining cooperation with many of your requests. In the past the productivity of this branch agency has been adequate.

A strong union operates within your agency and often complicates, if not confounds, your decisions. The management of the parent company has been intimidated by the union and is very non-supportive of your position as General Manager. Consequently, all hiring, firing and disciplinary matters are courses of action handled by upper management; you may only recommend.

> Recently, in response to economic pressures, the parent agency has sharply increased the quota of client billings (dollars in contracts) for this branch agency. They have decided to allot three months for successful compliance with these new standards and at that time they will evaluate your performance."

To test whether perceived uncertainty is influenced by whether or not the subject is himself the leader, four additional situation descriptions were written. These situations substituted an anonymously identified person for the subject as the leader, i.e., all references in the descriptions to "you" and "your", etc., were changed to "Mr. X" and "his", etc.

Procedure. The subjects came to the experiment by appointment and participated in groups of about 20 at a time. After a brief introduction and explanation of what they would be asked to do, each subject was given one of two test booklets.

Thirty three subjects received booklets containing the four original situations arranged in counterbalanced orders to control presentation-order effects. Each situation description was followed by three rating scales. The first two were 11 point scales used to assess the positive utility of success and the negative utility of failure, i.e., how positive or negative the subject would have felt if in the actual situation, he were or were not able to meet the new demands. The third scale was a 100-point probability scale on which the subject assessed his subjective probability (perceived uncertainty) of success in the situation; perceived uncertainty of failure was later computed as 1.00 minus perceived uncertainty.

Thirty eight subjects received booklets containing the four situations modified to present the leader as an anonymous Mr. X rather than the subject himself. The same three scales described above followed each counterbalanced situation except that the subjects (1) were asked to estimate how they thought

Mr. X would have felt if able and not able to meet the demands and (2) their perceived certainty that Mr. X would be able to meet the new demands.

Following the presentation of the booklets, a brief biographical questionnaire and Fiedler's 16 item LPC scale were given to each subject. After completing their tasks the subjects were debriefed and paid.

Six 2 x 2 x 4 analyses of variance with repeated measures on the last factor (Winer, 1962) were used to evaluate the hypotheses. In each of the ANOVA's the independent variables were: (a) the identity of the leader in the situation (the subject or Mr. X), (b) the subjects' LPC score (high or low), and (c) the four situations (Octants I, IV, V, and VIII). The categorization of subjects as either high or low LPC was based on the established normative mean for LPC scores (Posthuma, 1970).

The dependent variables for each of the analyses were: (a) perceived situational uncertainty defined as the subjective probability of success (p)--the smaller the p the greater the uncertainty; (b) risk--the product of uncertainty of failure (1.00 - p) and the negative utility of failure (U_f); (c) optimism--the product of uncertainty (p) and the positive utility of success (U_s); (d) the Subjective Expected Utility (SEU) of the situation--the sum of optimism and risk; (e) the positive utility of success (U_s); and (f) the negative utility of failure.

Of course, not all of the dependent variables are independent of one another. However, each could be considered as a measure of situational favorability and their inclusion here provides an opportunity to compare their relative association with situational favorabilty and the other independent variables.

Results

In most decision models the independence between p and U is an important assumption (Atkinson, 1964, is one exception). Therefore a test of this

assumption was undertaken as a prerequisite to the ANOVA's on the dependent measures.

Pearson product moment correlations were computed between p and both the positive and negative utilities for each of the situations. These correlations generally support the independence of p, U_s, and U_f. The average correlation between all the pairs of p's and U's was virtually zero ($\bar{r}$ = .009), while only 4 of the 32 r's were significant--essentially the number one would expect to be significant by chance. Inspection revealed no curvilinearity.

The first analysis performed was the analysis of variance of p. As can be

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Insert Table 1 about here

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seen, in Table 1, neither the identity of the leader nor the LPC of the subject was related to p--suggesting that the impact of the situation was not influenced by the use of self reports or by the leadership style (LPC) of the subject. Also as can be seen in Table 1, the relationship between uncertainty (p) and the situation is highly significant. A plotting of the means for these situations is presented in Figure 1. Clear support is found for the hypothesis that as the situation decreases in favorability p also decreases; octant VIII has the greatest amount of uncertainty and octant I the least.

Insert Figure 1 about here

Finally, the summary in Table 1 indicates that there were no interactions among any of the independent measures.

The second ANOVA analyzed the perception of risk [$(1.00 - p)U_f$]. As can be seen in Table 2, the leader's projected identity and the subject's LPC were

TABLE 1

Analysis of Variance of

Subjective Probability of Success

SOURCE	df	MS	F
Between Subjects			
Identity of Leader (A)	1	.1031	1.282
LPC (B)	1	.0720	.896
AXB	1	.0785	.976
Error Between	67	.0803	
Within Subjects			
Situation (C)	3	1.091	66.002*
BXC	3	.0077	.468
CXA	3	.0022	.135
AXBXC	3	.0138	.833
Error Within	201	.0165	

* $p < .001$

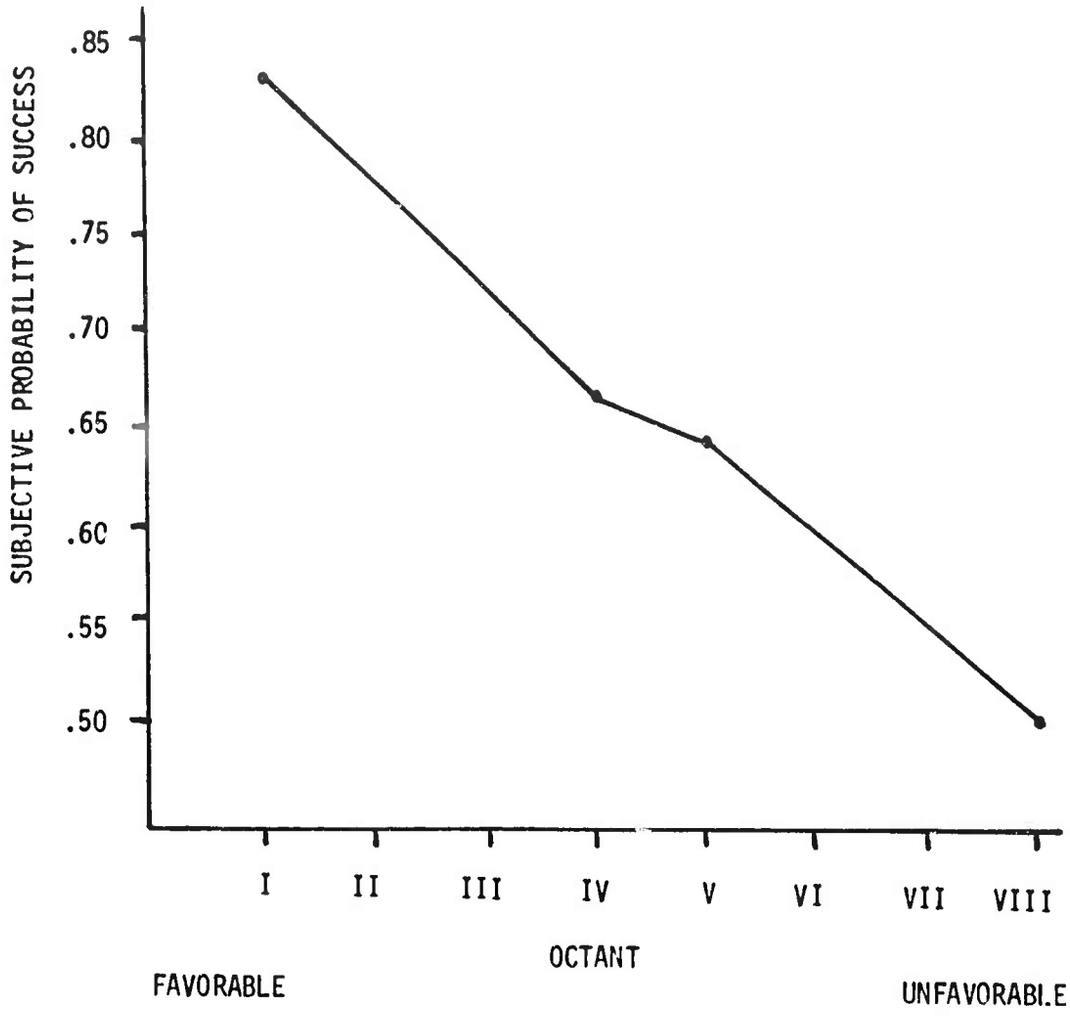

Figure 1: Relationship between subjective probability of success (p) and situational favorability.

Insert Table 2 about here

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not significantly related to the dependent measure and no interactions were found. But, situational favorability was highly related to risk; figure 2 shows the plot of the means. Again the results support the hypothesis that as the favorability of the situation decreases risk increases--although the strength of the relationship is smaller here than between perceived uncertainty and situational favorability (table 1).

Insert Figure 2 about here

Additional ANOVAS were computed on the remaining dependent measures with very similar results. SEU was found to be significantly related to the situations ($F = 56.87$; $df = 3/201$; $p < .01$), but not to leader identity, LPC, nor were there any interactions; the greater the situational favorabilty, the greater the SEU. Negative utility for failure (U_f) was also found to be significantly related to the situation although much less so than the previously mentioned variables ($F = 6.01$; $df = 3/201$; $p < .01$). Situations low in favorability were found to have a less negative U_f than highly favorable situations. Positive utility for success (U_s) differs from the general pattern of results up to this point. Positive utility for success was significantly related to the situations ($F = 7.61$; $df = 3/201$; $p < .01$; favorable situations had a higher U_s than unfavorable situations. LPC, however, also was found to be related to this variable as a main effect ($F = 4.88$; $df = 1/67$; $p < .05$); high LPC subjects had lower U_s for the situations than did low LPC subjects.

TABLE 2

Analysis of Variance of Risk

SOURCE	df	MS	F
Between Subjects			
Identity of Leader (A)	1	3.964	.989
LPC (B)	1	.893	.223
AXB	1	.925	.231
Error Between	67	4.00	
Within Subjects			
Situation (C)	3	17.371	20.388*
BXC	3	.500	.587
CXA	3	.269	.316
AXBXC	3	.249	.292
Error Within	201	.852	

*$p < .001$

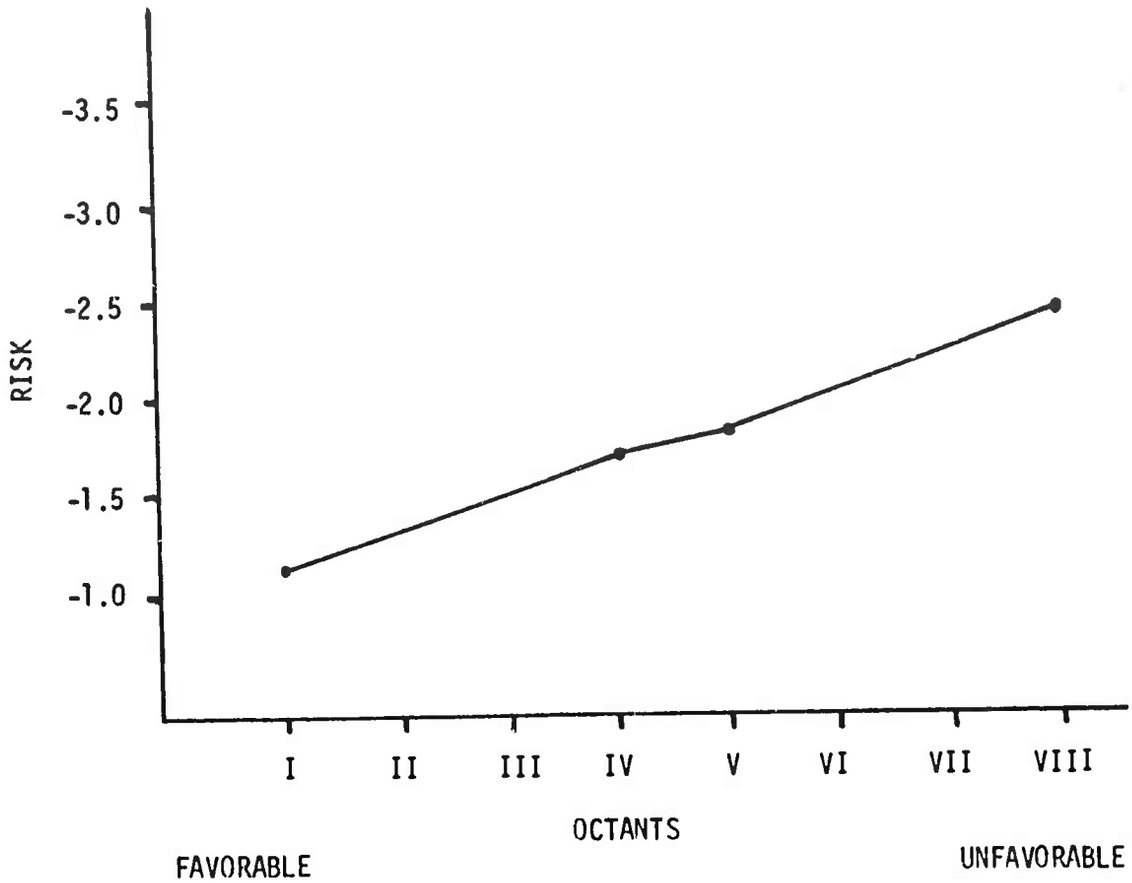

Figure 2: Relationship between risk and situational favorability.

In addition to these two changes in the pattern of results, there was an interaction between the identity of the leader and the subject's LPC ($F = 4.49$; $df = 1/67$; $p < .05$). Therefore, the main effect of LPC upon U_s was modified such that the difference between high and low LPC subjects was only observed when the subjects estimate the U_s for an anonymous leader and not when they reported their own U_s.

The final analysis performed was an ANOVA on Optimism (pU_s). As would be expected, since it is comprised of p and U_s, optimism was significantly related to situational favorability ($F = 46.32$; $df = 3/201$; $p < .01$). The greater the situational favorability the greater the optimism. In addition, just as with the positive utility of success variable alone, LPC was found to be significantly related to optimism as a main effect ($F = 6.03$; $df = 1/67$; $p < .05$). Low LPC subjects were more optimistic than high LPC subjects were. However, this effect was modied by a significant interaction with the leaders identity ($F = 4.18$; $df = 1/67$; $p < .05$) such that Low LPC subjects were more optimistic than high LPC subjects only when asked about an anonymous leader.

Discussion

It was the purpose of this study to test, in an experimental setting, the relation between Fiedler's concept of situational favorability and perceived uncertainty, risk and related measures. As hypothesized, both perceived uncertainty and risk were related to situational favorability. Highly favorable situations were characterized by certainty and little risk while unfavorable situations were uncertain and risky. Each of the additional measures were also related to situational favorability but to a smaller extent.

Of the six dependent variables considered in this study clearly the strongest relationship was found between situational favorability and perceived

uncertainty (P). Over 44% of the variance in perceived uncertainty can be accounted for by the situation. This relationship was not altered by the identity of the leader in the situations nor the LPC of the subject. Interpreting the psychological meaning of situational favorability as the degree of perceived uncertainty has a number of advantages over Fiedler's present control or influence interpretation. Some of these advantages are:

(1) Because the concept of uncertainty is prevalent in contingency approaches to organizations there is the possibility of integrating Fiedler's work with these other approaches to form a comprehensive organizational structure-leadership pattern system. Such a system would have obvious theoretical advantages over the present collection of loosely associated approaches. In addition, the practical implications of a comprehensive organization structure-leadership pattern system imply that the selection of organizational designs and leaders should not be made independently. It is reasonable to expect that leadership patterns must be compatible with an organization's structure or vice versa in order to maximize performance.

(2) Interpreting situational favorability as an uncertainty dimension logically associates Fiedler's work with work done in decision theory and information processing. The data suggest that our understanding of leadership may be increased significantly by consideration of leader decision behavior. This view is shared by Vroom and Yetton (1973) and Nebeker and Mitchell (1974). Perhaps such an orientation can help us better understand what factors are most important in influencing leadership styles and why some leadership styles are effective in some situations and not in others. While neither of these issues is new, using decision theory as a tool to understand them is. Because

the data presented here suggests that high and low LPC individuals do not see the situations differently, and since performance differences must be explained by differences in behavior, the different ways leaders make decisions and process information in response to the situation may help us explain the differences in their behavior.

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FOOTNOTES

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[2]The opinions or assertions contained herein are those of the authors and are not to be construed as official or reflecting the views of the Navy Department.